Appendix C

Plant Community Descriptions of Effigy Mounds National Monument

Introduction to NVCS Plant Community Descriptions

As a result of this vegetation mapping project, we identified 17 National Vegetation Classification System (NVCS) plant communities (associations) at Effigy Mounds National Monument (EFMO). Essential for recognizing floristic vegetation types (association and alliance levels of the NVCS), detailed vegetation descriptions are derived to "provide specific information on the geographical distribution, level of acceptable physiognomic and compositional variation, and the key ecological processes and environmental/abiotic factors that are associated with a type" (Grossman et al.1998). For mapping projects within the USGS-NPS Vegetation Mapping Program, vegetation descriptions not only supply the global (regional) information of plant communities, but also local information that deals directly with the plant characterization typical of the National Park unit.

With the following pages, we provide vegetation descriptions for each plant community identified at EFMO with this project. In Appendix D: Dichotomous Key to Plant Communities of Effigy Mounds National Monument, we provide a dicothomous key to each of these plant communities. By using the key in combination with these community descriptions in the field, one can hopefully determine the proper plant community.

These descriptions are a combination of information from exisiting community descriptions from NatureServe and newly acquired and analyzed vegetation sample data from this vegetation mapping project. Because some plant communities are based on limited samples, there may be some variations in vegetation characteristizations not captured by this project.

We have organized the NVCS plant communities within Ecological System units (NatureServe 2003b, Comer et al 2003), as follows:

- North-Central Interior Maple-Basswood Forest,
- North-Central Interior Dry-Mesic Oak Forest and Woodland,
- Paleozoic Plateau Bluff and Talus,
- Central Tallgrass Prairie,
- North-Central Interior Floodplain.

Appendix A: Ecological System Units of Effigy Mounds National Monument provides brief descriptions to each of these Ecological System units. For full descriptions, however, refer to the NatureServe documentation as cited above.

List of Vegetation Community Types (NVCS Associations)

Organized by NVCS structure.

Mapping the NVCS Plant Commutity (Association) Classification

Our mapping of natural/semi-natural vegetation is based on the NVCS plant communities (associations) we identified at EFMO during this project. Table C-1 lists each NVCS plant community at EFMO and their corresponding map class with which we mapped the plant community.

To understand more fully how vegetation communities are represented on the map coverages, see Appendix G: Map Class Descriptions and Visual Guide.

Table C-1. NVCS vegetation communities (associations) with crosswalk to their respective map classes.

Association Scientific Name	Association Synonym Name	CEGL Code	NVCS Code	Link to Map Classes*
Ecological System: North-Central Interior Maple-Basswood Forest				
Acer saccharum - *Tilia americana* / *Ostrya virginiana* - *Carpinus caroliniana* Forest	North-central Maple - Basswood Forest	CEGL002062	I.B.2.N.a.8	FOM, FMB, FNO, FOX, FOB, FMH
Fraxinus pennsylvanica - *Ulmus americana* - (*Juglans nigra*, *Celtis occidentalis*) Forest	Ash - Elm - Walnut - Hackberry Semi-natural Forest	CEGL005239	I.B.2.N.a.47	FRH
Ecological System: North-Central Interior Dry-Mesic Oak Forest and Woodland				
Quercus alba - *Quercus rubra* - *Carya ovata* Glaciated Forest	Midwestern White Oak - Red Oak Forest	CEGL002068	I.B.2.N.a.27	FWO**, FOH, FSH, FBA, FTA
Ecological System: Paleozoic Plateau Bluff and Talus				
Quercus muehlenbergii - *Quercus* (*alba, velutina*) - (*Juniperus virginiana* var. *virginiana*) Bluff Woodland	Chinquapin Oak Bluff Woodland	CEGL002144	II.B.2.N.a.21	FRC, FHP
Ecological System: Central Tallgrass Prairie				
Andropogon gerardii - *Sorghastrum nutans* - (*Sporobolus heterolepis*) - *Liatris* spp. - *Ratibida pinnata* Herbaceous Vegetation	Central Mesic Tallgrass Prairie	CEGL002203	V.A.5.N.a.2	HRP
Ecological System: North-Central Interior Floodplain				
Acer saccharinum - *Ulmus americana* - (*Populus deltoides*) Forest	Silver Maple - Elm - (Cottonwood) Forest	CEGL002586	I.B.2.N.d.4	FMC, FEH, FSW, FBO
Populus deltoides - *Salix nigra* Forest	Midwestern Cottonwood - Black Willow Forest	CEGL002018	I.B.2.N.d.15	FCW
Salix interior Temporarily Flooded Shrubland	Sandbar Willow Shrubland	CEGL008562	III.B.2.N.d.6	SWL
Cephalanthus occidentalis / *Carex* spp. Northern Shrubland	Northern Buttonbush Swamp	CEGL002190	III.B.2.N.f.1	SBB
Phalaris arundinacea Eastern Herbaceous Vegetation	Reed Canary Grass Eastern Marsh	CEGL006044	V.A.5.N.k.20	HCG
Schoenoplectus fluviatilis - *Schoenoplectus* spp. Herbaceous Vegetation	River Bulrush Marsh	CEGL002221	V.A.5.N.k.26	HRB
Schoenoplectus tabernaemontani - *Typha* spp. - (*Sparganium* spp., *Juncus* spp.) Herbaceous Vegetation	Bulrush - Cattail - Burreed Shallow Marsh	CEGL002026	V.A.5.N.k.33	HGB
Sagittaria latifolia - *Leersia oryzoides* Herbaceous Vegetation	Arrowhead - Rice Cutgrass Marsh	CEGL005240	V.B.2.N.e.7	HRC, HBA
Potamogeton spp. - *Ceratophyllum* spp. Midwest Herbaceous Vegetation	Midwest Pondweed Submerged Aquatic Wetland	CEGL002282	V.C.2.N.a.14	HPW

Association Scientific Name	Association Synonym Name	CEGL Code	NVCS Code	Link to Map Classes*
Nelumbo lutea Herbaceous Vegetation	American Lotus Aquatic Wetland	CEGL004323	V.C.2.N.a.100	HAL
Nuphar lutea ssp. *advena* - *Nymphaea odorata* Herbaceous Vegetation	Water Lily Aquatic Wetland	CEGL002386	V.C.2.N.a.102	HWL
River Mud Flats Sparse Vegetation	River Mud Flats	CEGL002314	VII.C.4.N.c.1	N/A

** Or map class phases, in which we mapped repeating variations within a plant association (recognized in table with multiple map class assignments)*

*** The FWO map class phase also maps in part the Chinquapin Oak Bluff Woodland plant association due to limitations in recognizing this type on the aerial photographs.*

Acer saccharum - Tilia americana / Ostrya virginiana - Carpinus caroliniana Forest

COMMON NAME	Sugar Maple - American Basswood / Eastern Hop-hornbeam - Ironwood Forest
SYNONYM	North-central Maple - Basswood Forest
PHYSIOGNOMIC CLASS	Forest (I)
PHYSIOGNOMIC SUBCLASS	Deciduous forest (I.B)
PHYSIOGNOMIC GROUP	Cold-deciduous forest (I.B.2)
PHYSIOGNOMIC SUBGROUP	Natural/Semi-natural Cold-deciduous forest (I.B.2.N)
FORMATION	Lowland or submontane cold-deciduous forest (I.B.2.N.a)
ALLIANCE	ACER SACCHARUM - TILIA AMERICANA - (QUERCUS RUBRA) FOREST ALLIANCE

CLASSIFICATION CONFIDENCE LEVEL 1

USFWS WETLAND SYSTEM Lowland or submontane cold-deciduous forest

CONCEPT SUMMARY

Globally

This maple - basswood forest community type is found in the north-central United States. Stands occur on flat to steep slopes on loamy soils derived from glacial till or, less commonly, loess. The soils are well-drained, fertile, and deep. The tree canopy of this community is moderately dense to dense and greatly affects the composition of the understory. *Acer saccharum* and *Tilia americana* are the most prevalent tree species. Other common tree species include *Carpinus caroliniana, Carya cordiformis, Carya ovata, Fraxinus pennsylvanica, Juglans nigra, Ostrya virginiana, Quercus alba, Quercus rubra*, and *Ulmus* spp. The scattered shrub layer contains species such as *Cornus alternifolia, Ribes* spp., *Sambucus* spp., and *Zanthoxylum americanum*. Spring ephemerals are a distinctive part of the herbaceous layer. Common herbaceous species include *Anemone quinquefolia, Claytonia* spp., *Dicentra cucullaria, Erythronium* spp., *Polygonatum pubescens, Sanicula odorata (= Sanicula gregaria), Trillium grandiflorum*, and *Uvularia grandiflora*.

RANGE

Effigy Mounds National Monument

This community occurs throughout the monument and in adjacent lands.

Globally

This maple - basswood forest community type is found in the north-central United States, ranging from northern Illinois west to South Dakota.

ENVIRONMENTAL DESCRIPTION

Effigy Mounds National Monument

This community is found at mid to low slopes of shaded ravines, and a variety of other topographic locations, including ridge tops, and where extensive logging has removed much of the oak.

Globally

This community is found on flat to steep slopes on loamy soils derived from glacial till or, less commonly, loess (Curtis 1959). The soils are well-drained, fertile, and deep (MNNHP 1993).

MOST ABUNDANT SPECIES

Effigy Mounds National Monument

Stratum	Species
CANOPY	*Acer saccharum, Tilia Americana, Quercus rubra*
SUBCANOPY	*Ostrya Virginiana, Acer saccharum, Carya cordiformis*
SHRUB	*Ribes* spp., *Zanthoxylum americanum*
HERBACEOUS	*Adiatum pedatum, Hepatica acutiloba, Asarum canadense, Osmorhiza claytoni, Laportea canadensis*

Globally

Stratum	Species

CHARACTERISTIC SPECIES

Effigy Mounds National Monument

Acer saccharum, Tilia americana, Adiantum pedatum, Athyrium filix-femina, Thalictrum diocum, Uvularia grandifora

Globally

VEGETATION DESCRIPTION

Effigy Mounds National Monument

The tree canopy cover of this community is moderately dense. *Acer saccharum, Tila americana*, and *Quercus rubra* are the most prevalent tree species. Other common tree species include *Quercus alba, Carya cordiformis, Ulmus,* spp., *Fraxinus americana, Juglans nigra,* and *Ostrya virginiana*. Common members of the subcanopy include *Ostrya virginiana, Acer saccharum, Prunus serotina*, and *Carpinus caroliniana*. The shrub layer is variable but can include *Carya ovata, Ostrya virginiana, Carya cordiformis, Acer saccharum, Fraxinus americana,* and *Zanthoxylum americanum*. The herbaceous layer is also variable and appears somewhat dependent on disturbance factors and exposure. The least disturbed stands of shaded ravines and north-facing slopes, typical species with high abundance include *Uvularia grandiflora, Solidago flexicaulis, Hepatica acutiloba, Aralia nudicaulis, Adiantum pedatum, Thalictrum dioicum, Athyrium filix-femina, Asarum canadense, and Caulophyllum thalictroides.* On ridgetops, south-facing slopes, and in disturbed stands, additional species more typical of the Midwestern White Oak - Red Oak Forest are found. *Laportea canadensis* can also be prominent in the herbaceous layer.

Globally

The tree canopy of this community is moderately dense to dense and greatly affects the composition of the understory. Only shade-tolerant species are able to persist (Curtis 1959). *Acer saccharum* and *Tilia americana* are the most prevalent tree species. Other common tree species include *Carpinus caroliniana, Carya cordiformis, Carya ovata, Fraxinus pennsylvanica, Juglans nigra, Ostrya virginiana, Quercus alba, Quercus rubra*, and *Ulmus* spp. The scattered shrub layer contains species such as *Cornus alternifolia, Ribes* spp., *Sambucus* spp., and *Zanthoxylum americanum*. Spring ephemerals are a distinctive part of the herbaceous layer. Common herbaceous species include *Anemone quinquefolia, Claytonia* spp., *Dicentra cucullaria, Erythronium* spp., *Polygonatum pubescens, Sanicula odorata (= Sanicula gregaria), Trillium grandiflorum*, and *Uvularia grandiflora* (Curtis 1959, MNNHP 1993).

OTHER NOTEWORTHY SPECIES

CONSERVATION RANK G3G4. These rich mesic hardwood forests are poorly protected throughout their range. They were once the matrix forests over large parts of the upper Midwest, and now occur primarily in small (<1000 acres) fragments, many of which have been logged or grazed.

DATABASE CODE CEGL002062

COMMENTS

Effigy Mounds National Monument

Stands occurring the new Heritage track have been recently and repeatedly logged. Herbaceous cover can be sparse and these stands.

Globally

REFERENCES

Cahayla-Wynne, R., and D. C. Glenn-Lewin. 1978. The forest vegetation of the Driftless Area, northeast Iowa. The American Midland Naturalist 100:307–319.

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Lindsey, A. A., D. V. Schmelz, and S. A. Nichols. 1969. Natural areas in Indiana and their preservation. Indiana Natural Areas Survey. Purdue University, Lafayette, IN. 594 pp.

MNNHP [Minnesota Natural Heritage Program]. 1993. Minnesota's native vegetation: A key to natural communities. Version 1.5. Minnesota Department of Natural Resources, Natural Heritage Program, St. Paul, MN. 110 pp.

Note:

This association is found in six different map classes:

1) East-facing maple phase
2) North-facing maple phase
3) North-facing red oak phase
4) Disturbed oak phase
5) Disturbed maple – basswood phase
6) Disturbed hardwoods phase

Fraxinus pennsylvanica - Ulmus americana - (Juglans nigra, Celtis occidentalis) Forest

COMMON NAME	Green Ash - American Elm - (Black Walnut, Northern Hackberry) Forest
SYNONYM	Ash - Elm - Walnut - Hackberry Semi-natural Forest
PHYSIOGNOMIC CLASS	Forest (I)
PHYSIOGNOMIC SUBCLASS	Deciduous forest (I.B)
PHYSIOGNOMIC GROUP	Cold-deciduous forest (I.B.2)
PHYSIOGNOMIC SUBGROUP	Natural/Semi-natural Cold-deciduous forest (I.B.2.N)
FORMATION	Lowland or submontane cold-deciduous forest (I.B.2.N.a)
ALLIANCE	FRAXINUS PENNSYLVANICA - (ULMUS AMERICANA) FOREST ALLIANCE

CLASSIFICATION CONFIDENCE LEVEL 3

USFWS WETLAND SYSTEM Lowland or submontane cold-deciduous forest

CONCEPT SUMMARY

Globally

This semi-natural ash - elm community is found in the central midwestern United States. Stands occur in mesic, sometimes bottomland, disturbed draws or in upland, disturbed sites. Tree canopy cover varies from immature and open to mature, closed forest. Tree dominants include *Fraxinus pennsylvanica* and *Ulmus americana* (the latter often not reaching maturity because of Dutch elm disease). Typical associates include *Juglans nigra* and *Celtis occidentalis*.

RANGE

Effigy Mounds National Monument

This community occurs throughout the monument and in adjacent lands.

Globally

This semi-natural ash - elm community is found in the central upper midwestern United States.

ENVIRONMENTAL DESCRIPTION

Effigy Mounds National Monument

Stands occur in disturbed draws and upland ravines, often as small, linear communities in the bottom of v-shaped ravines. Soils are typically moist especially during spring melt-off. Direct sunlight is minimal.

Globally

Stands occur in mesic, sometimes bottomland, disturbed draws or in upland, disturbed sites.

MOST ABUNDANT SPECIES

Effigy Mounds National Monument

Stratum	Species
CANOPY	*Fraxinus pennsylvanica, Fraxinus nigra, Ulmus Americana, Celtis occidentalis, Juglans nigra*
SUBCANOPY	
SHRUB	
HERBACEOUS	*Laportea canadensis*

Globally

Stratum	Species

CHARACTERISTIC SPECIES

Effigy Mounds National Monument

Fraxinus pennsylvanica, Fraxinus nigra, Ulmus americana, Celtis occidentalis

Globally

VEGETATION DESCRIPTION

Effigy Mounds National Monument

Tree canopy cover ranges from somewhat open to closed forest. Tree dominants include *Fraxinus pennsylvanica, Ulmus americana, Juglans nigra,* and *Celtis occidentalis.* The herbaceous layer is dominated by *Laportea canadensis*.

Globally

The vegetation is dominated by deciduous trees. Tree canopy cover varies from immature and open to mature, closed forest. Tree dominants include *Fraxinus pennsylvanica* and *Ulmus americana* (the latter often not reaching maturity because of Dutch Elm Disease). Typical associates include *Juglans nigra* and *Celtis occidentalis*.

OTHER NOTEWORTHY SPECIES

CONSERVATION RANK GW.

DATABASE CODE CEGL005239

COMMENTS

Effigy Mounds National Monument

A compositionally similar community occurs in bottomlands and in low river terraces, but typically has *Acer saccharinum* as a component. We considered this bottomland community to be a version of the Silver Maple-Elm type.

Globally

REFERENCES

Quercus alba - Quercus rubra - Carya ovata Glaciated Forest

COMMON NAME	White Oak - Northern Red Oak - Shagbark Hickory Glaciated Forest
SYNONYM	Midwestern White Oak - Red Oak Forest
PHYSIOGNOMIC CLASS	Forest (I)
PHYSIOGNOMIC SUBCLASS	Deciduous forest (I.B)
PHYSIOGNOMIC GROUP	Cold-deciduous forest (I.B.2)
PHYSIOGNOMIC SUBGROUP	Natural/Semi-natural Cold-deciduous forest (I.B.2.N)
FORMATION	Lowland or submontane cold-deciduous forest (I.B.2.N.a)
ALLIANCE	QUERCUS ALBA - (QUERCUS RUBRA, CARYA SPP.) FOREST ALLIANCE

CLASSIFICATION CONFIDENCE LEVEL 1

USFWS WETLAND SYSTEM Lowland or submontane cold-deciduous forest

CONCEPT SUMMARY

Globally

This oak forest community is widespread in the north-central United States. Stands occur primarily on glaciated, rolling topography on a wide variety of soils that have a dry-mesic moisture condition. The canopy is variable but typically closed (>80%). *Quercus alba* and *Quercus rubra* are the leading dominants, but *Quercus ellipsoidalis, Quercus macrocarpa, Quercus velutina*, and *Carya ovata* can also be codominant. Typical associates include *Juglans nigra* and, more south or east, *Carya alba* and *Carya glabra*. The subcanopy contains *Ostrya virginiana, Prunus serotina, Sassafras albidum*, and, increasingly, *Acer rubrum* or *Acer saccharum*. The shrub layer is quite variable but can include *Cornus alternifolia, Cornus florida* (southward), *Cornus foemina, Corylus americana* (northward), *Parthenocissus quinquefolia, Ribes cynosbati*, and *Zanthoxylum americanum*. The herbaceous layer includes *Amphicarpaea bracteata, Anemone virginiana, Symphyotrichum cordifolium (= Aster cordifolius var. sagittifolius), Botrychium virginianum, Brachyelytrum erectum, Circaea lutetiana ssp. canadensis, Desmodium glutinosum, Galium concinnum, Geranium maculatum, Osmorhiza claytonii, Sanicula odorata*, and *Maianthemum racemosum*.

RANGE

Effigy Mounds National Monument

This community occurs throughout the monument and in adjacent lands.

Globally

This oak forest community is widespread in the north-central United States, ranging from Ohio west to Minnesota, south to Iowa, and east to Indiana.

ENVIRONMENTAL DESCRIPTION

Effigy Mounds National Monument

This community is widespread on mid to high slopes of all aspects. Soils are dry-mesic silt loams.

Globally

This community is found primarily on glaciated, rolling topography on a wide variety of soils that have a dry-mesic moisture condition. It is also found in the unglaciated Driftless Area of the upper Midwest.

MOST ABUNDANT SPECIES

Effigy Mounds National Monument

Stratum	Species
TREE CANOPY	*Quercus rubra, Quercus alba (Populus grandidentata or Carya ovata in some stands where logging removed the majority of the oaks)*
SUBCANOPY	*Ostrya virginiana, Prunus serotina, Acer saccharum*
SHRUB	*Zanthoxylum americanum*
HERBACEOUS	*Amphicarpaea bracteata, Parthenocissus quinquefolia*

Globally

Stratum	Species

CHARACTERISTIC SPECIES

Effigy Mounds National Monument

Quercus rubra, Quercus alba, Amphicarpa bracteata, Botrychium virginianmum, Cryptotaenia canadensis, Sanicula gregaria, Aster shortii

Globally

VEGETATION DESCRIPTION

Effigy Mounds National Monument

Quercus rubra and *Quercus alba* typically dominate the canopy, but *Carya ovata* or *Acer saccharum* codominate in some stands. Populus grandidentata may be the leading dominant where most of the oaks have been logged. Other associates may include *Tilia americana, Carya cordiformis,* and *Fraxinus americana*. The subcanopy contains *Ostrya virginiana, Prunus serotina*, or *Acer saccharum.* Total cover is typically closed. The shrub layer is variable but may include *Carya ovata, Ostrya virginiana, Carya cordiformis, Acer saccharum,* and *Zanthoxylum americanum*. The herbaceous layer includes *Desmodium glutinosum, Parthenocissus quinquefolia, Amphicarpa bracteata, Sanicula gregaria, Osmorhiza claytonii, Brachyelytrum erectum, Phryma leptostachya, Laportea canadensis,* and *Thalictrum dioicum*.

Globally

The canopy is variable but typically closed (>80%). *Quercus alba* and *Quercus rubra* are the leading dominants, but *Quercus ellipsoidalis, Quercus macrocarpa, Quercus velutina*, and *Carya ovata* can also be codominant. Typical associates include *Juglans nigra*, and more south or east, *Carya alba* and *Carya glabra*. The subcanopy contains *Ostrya virginiana, Prunus serotina, Sassafras albidum*, and, increasingly, *Acer rubrum* or *Acer saccharum*. The shrub layer is quite variable but can include *Cornus alternifolia, Cornus florida* (southward), *Cornus foemina, Corylus americana* (northward), *Parthenocissus quinquefolia, Ribes cynosbati*, and *Zanthoxylum americanum*. The herbaceous layer includes *Amphicarpaea bracteata, Anemone virginiana, Symphyotrichum cordifolium (= Aster sagittifolius), Botrychium virginianum, Brachyelytrum erectum, Circaea lutetiana ssp. canadensis (= Circaea quadrisulcata), Desmodium glutinosum, Galium concinnum, Geranium maculatum, Osmorhiza claytonii, Sanicula odorata (= Sanicula gregaria)*, and *Maianthemum racemosum (= Smilacina racemosa)* (Anderson 1996, Curtis 1959, MNNHP 1993, Nelson 1985).

In Minnesota, *Quercus ellipsoidalis* replaces *Quercus velutina* in the east-central part of the state (e.g., Washington County).

OTHER NOTEWORTHY SPECIES

CONSERVATION RANK G4?. Many sites have been cleared, logged, and grazed. It is not clear how many high quality, large tracts exist.

DATABASE CODE CEGL002068

COMMENTS

Effigy Mounds National Monument

Stands occurring in the new Heritage track have been recently and repeatedly logged.

Globally

REFERENCES

Abrams, M. D. 1992. Fire and the development of oak forests. BioScience 42(5):346–353.

Anderson, D. M. 1996. The vegetation of Ohio: Two centuries of change. Draft. Ohio Biological Survey.

Curtis, J. T. 1959. The vegetation of Wisconsin: An ordination of plant communities. University of Wisconsin Press, Madison. 657 pp. [reprinted in 1987]

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Nelson, P. W. 1985. The terrestrial natural communities of Missouri. Missouri Natural Areas Committee, Jefferson City. 197 pp. Revised edition, 1987.

Note:

This association is found in five different map classes:

1) White-oak chinquapin oak phase
2) Oak – hickory phase
3) Shagbark hickory phase
4) Bigtooth aspen phase
5) Trembling aspen phase

Quercus muehlenbergii - *Quercus* (*alba*, *velutina*) - (*Juniperus virginiana* var. *virginiana*) Bluff Woodland

COMMON NAME	Chinquapin Oak - (White Oak, Black Oak) - (Eastern Red-cedar) Bluff Woodland
SYNONYM	Chinquapin Oak Bluff Woodland
PHYSIOGNOMIC CLASS	Woodland (II)
PHYSIOGNOMIC SUBCLASS	Deciduous woodland (II.B)
PHYSIOGNOMIC GROUP	Cold-deciduous woodland (II.B.2)
PHYSIOGNOMIC SUBGROUP	Natural/Semi-natural Cold-deciduous woodland (II.B.2.N)
FORMATION	Cold-deciduous woodland (II.B.2.N.a)
ALLIANCE	QUERCUS MUEHLENBERGII WOODLAND ALLIANCE

CLASSIFICATION CONFIDENCE LEVEL 3

USFWS WETLAND SYSTEM Cold-deciduous woodland

CONCEPT SUMMARY

Globally

This chinquapin oak woodland type occurs primarily on bluffs of large rivers in the midwestern United States. Stands occur in scattered areas along steep southwest-facing bluffs or slopes, particularly on the Mississippi River. Presumably the underlying soils and bedrock have a calcareous influence. Stands contain an open tree layer, with *Quercus muehlenbergii* as the characteristic dominant, and *Quercus alba, Quercus velutina, Quercus macrocarpa*, and *Juniperus virginiana* as common associates. *Cornus foemina* may be common in the shrub layer. The ground layer may contain a dry to dry-mesic prairie flora, but little is known about this type and few stands are available for characterization.

RANGE

Effigy Mounds National Monument

This woodland type is scattered on bluffs along the Mississippi and Yellow Rivers.

Globally

This chinquapin oak woodland type occurs primarily on bluffs of large rivers in the midwestern United States, ranging from Iowa and Illinois to Michigan and Wisconsin.

ENVIRONMENTAL DESCRIPTION

Effigy Mounds National Monument

This community type occurs on steep south to southwest facing bluffs.

Globally

Stands occur in scattered areas along steep, southwest-facing bluffs or slopes, particularly on the Mississippi River. Presumably the underlying soils and bedrock have a calcareous influence.

MOST ABUNDANT SPECIES

Effigy Mounds National Monument

Stratum	Species
TREE CANOPY	*Quercus muehlenbergii, Juniperus virginiana*
HERBACEOUS	*Carex eburnea* (in Juniper dominated stands) *Galium boreale*

Globally

Stratum	Species

CHARACTERISTIC SPECIES

Effigy Mounds National Monument

Quercus muehlenbergii, Juniperus virginiana, Carex eburnea, Dodecatheon meadia, Elymus villosus, Aquilegia canadensis, Amorpha canescens

Globally

VEGETATION DESCRIPTION

Effigy Mounds National Monument

Quercus muehlenbergii or *Juniperus virginiana* dominate an open canopy. *Quercus alba or Q. macrocarpa* are common associates. Other tree species that may be present at low cover include *Juglans nigra, Fraxinus* spp. *Celtis occidentalis*, and *Tilia americana*. Total cover is typically <65%, but may be as high as 80% in some stands. The shrub layer is <5%; species present may include *Zanthoxylum americanum, Ribes missouriense*, *Viburnum dentatum, Prunus virginiana*, *Staphylea trifolia*, and *Ostrya virginiana*. A diverse composition of woodland and savanna species can be found in the herbaceous layer including *Amphicarpa bracteata, Euphorbia corollata, Solidago speciosa, Taenidia integerrima, Hystrix patula, Smilax eccirrhata,*

Dodecatheron meadia, Heuchera richardsonii, Elymus villosus, and Carex convoluta. Stands dominated by *Juniperus virginiana* may include scatterd *Betula payrifera* and *Carex eburnea* in the herbaceous layer.

Globally
Stands contain an open tree layer, with *Quercus muehlenbergii* as the characteristic dominant, and *Quercus alba, Quercus velutina, Quercus macrocarpa*, and *Juniperus virginiana* as common associates. *Cornus foemina* may be common in the shrub layer. The ground layer may contain a dry to dry-mesic prairie flora, but little is known about this type, and few stands are available for characterization.

OTHER NOTEWORTHY SPECIES

CONSERVATION RANK G2G3. This type has a relatively restricted range, occurring in small patches on large bluffs along big rivers. Further evidence from Iowa is needed concerning its status there to more firmly establish the rank of this type.

DATABASE CODE CEGL002144

COMMENTS
Effigy Mounds National Monument
This community may require active management to maintain its woodland character.

Globally

REFERENCES

Note:
This association is found in two different map classes:
1) Red-cedar phase
2) Hillside prairie phase

Andropogon gerardii - Sorghastrum nutans - (*Sporobolus heterolepis*) - *Liatris* spp. - *Ratibida pinnata* Herbaceous Vegetation

COMMON NAME	Big Bluestem - Yellow Indiangrass - (Prairie Dropseed) - Blazingstar species - Gray-head Prairie Coneflower Herbaceous Vegetation
SYNONYM	Central Mesic Tallgrass Prairie
PHYSIOGNOMIC CLASS	Herbaceous Vegetation (V)
PHYSIOGNOMIC SUBCLASS	Perennial graminoid vegetation (V.A)
PHYSIOGNOMIC GROUP	Temperate or subpolar grassland (V.A.5)
PHYSIOGNOMIC SUBGROUP	Natural/Semi-natural Temperate or subpolar grassland (V.A.5.N)
FORMATION	Tall sod temperate grassland (V.A.5.N.a)
ALLIANCE	ANDROPOGON GERARDII - (SORGHASTRUM NUTANS) HERBACEOUS ALLIANCE

CLASSIFICATION CONFIDENCE LEVEL 1

USFWS WETLAND SYSTEM Tall sod temperate grassland

CONCEPT SUMMARY

Globally

This mesic tallgrass prairie grassland community is found primarily in the glaciated central midwestern United States. Stands occur on silty clay loams and silty loams. Soils are typically derived from deep (>100 cm) silty clay and silt loam glacial till or unaltered loess, except for those in the Driftless Area. Soil drainage is intermediate, and nutrient content is high. The pH ranges from slightly acid to circumneutral. Topography varies from level to moderately sloping on uplands of glacial outwash and till plains. This is a tallgrass mixed herbaceous community dominated by perennial C4 bunch and sod grasses. Trees are infrequent to absent. The height of the dominant plants ranges from 0.5–2.0 m. Cover is high, typically 85–95%. Forb species composition varies more than grass composition from site to site. *Andropogon gerardii, Symphyotrichum ericoides (= Aster ericoides), Dalea candida, Eryngium yuccifolium, Helianthus pauciflorus ssp. pauciflorus, Liatris pycnostachya, Liatris spicata, Ratibida pinnata, Rosa carolina, Schizachyrium scoparium, Sporobolus heterolepis, Oligoneuron rigidum (= Solidago rigida)*, and *Sorghastrum nutans* are abundant throughout this community's range. *Amorpha canescens*, a subshrubby species, and *Salix humilis* are also typically present.

RANGE

Effigy Mounds National Monument

This community occurs on gently sloping uplands that were previously grazed pasturelands.

Globally

This mesic tallgrass prairie grassland community is found primarily in the glaciated central midwestern United States, ranging from western Ohio and Michigan west to east-central Minnesota, south to northern Missouri, and east to Indiana.

ENVIRONMENTAL DESCRIPTION

Effigy Mounds National Monument

This community type is represented in the North and South Units where previously grazed lands have been replanted with a prairie mix similar to this natural type.

Globally

Soils are characteristically deep (>100 cm) silty clay loams and silty loams, which occur in the glaciated portions of the Midwest. Soils are derived from glacial till or unaltered loess, or are in the Driftless Area. Soil drainage is intermediate and nutrient content is high. The pH ranges from slightly acid to circumneutral. Topography varies from level to moderately sloping on uplands of glacial outwash and till plains.

MOST ABUNDANT SPECIES

Effigy Mounds National Monument

Stratum	Species
GRAMINOID	*Andropogon gerardii, Sorghastrum nutans*
FORB	L*espedeza capitata, Solidago canadensis*

Globally

SHRUB	*Rosa carolina*
GRAMINOID	*Andropogon gerardii, Schizachyrium scoparium, Sorghastrum nutans, Sporobolus heterolepis*
FORB	*Eryngium yuccifolium, Helianthus pauciflorus ssp pauciflorus, Symphyotrichum ericoides*

CHARACTERISTIC SPECIES

Effigy Mounds National Monument

Andropogon gerardii, Sorghastrum nutans, Echinacea pallida, Liatris aspera, Monarda fistulosa

Globally

Andropogon gerardii, Schizachyrium scoparium, Sorghastrum nutans, Sporobolus heterolepis, Eryngium yuccifolium, Liatris pycnostachya, Silphium laciniatum

VEGETATION DESCRIPTION

Effigy Mounds National Monument

Prairie species have been planted by the park service where relatively large open pastures previously occupied ridgetops. Both the South and North Units have several acres of planted prairies, which are managed through controlled burns.

Globally

This is a tallgrass mixed herbaceous community dominated by perennial C4 bunch and sod grasses. Trees are rare to absent. The height of the dominant plants ranges from 0.5–2.0 m. Cover is high, 85–95% is typical. Ninety-five percent of the plant species are perennial. Forb species composition varies more than grass composition from site to site. *Andropogon gerardii, Symphyotrichum ericoides (= Aster ericoides), Dalea candida, Eryngium yuccifolium, Helianthus pauciflorus ssp. pauciflorus, Ratibida pinnata, Rosa carolina, Schizachyrium scoparium, Sporobolus heterolepis, Oligoneuron rigidum (= Solidago rigida)*, and *Sorghastrum nutans* are abundant throughout this community's range. *Amorpha canescens*, a subshrub species, and *Salix humilis* are also typically present.

OTHER NOTEWORTHY SPECIES

CONSERVATION RANK G1G2. This community has nearly been eliminated from its former range. Most former sites have been converted to cropland, pasture, or development. Others are succeeding to forest or woodland in the absence of fire. Many remaining sites are along rights-of-way (roads, railroads, utilities) and long term viability is problematic.

DATABASE CODE CEGL002203

COMMENTS

Effigy Mounds National Monument

Globally

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Acer saccharinum - Ulmus americana - (*Populus deltoides*) Forest

COMMON NAME	Silver Maple - American Elm - (Eastern Cottonwood) Forest
SYNONYM	Silver Maple - Elm - (Cottonwood) Forest
PHYSIOGNOMIC CLASS	Forest (I)
PHYSIOGNOMIC SUBCLASS	Deciduous forest (I.B)
PHYSIOGNOMIC GROUP	Cold-deciduous forest (I.B.2)
PHYSIOGNOMIC SUBGROUP	Natural/Semi-natural Cold-deciduous forest (I.B.2.N)
FORMATION	Temporarily flooded cold-deciduous forest (I.B.2.N.d)
ALLIANCE	ACER SACCHARINUM TEMPORARILY FLOODED FOREST ALLIANCE

CLASSIFICATION CONFIDENCE LEVEL 2

USFWS WETLAND SYSTEM Temporarily flooded cold-deciduous forest

CONCEPT SUMMARY

Globally

This silver maple - elm - cottonwood forest community is found throughout the midwestern United States and parts of the eastern United States. Stands occur on large, regularly flooded floodplains. Canopy cover is more-or-less closed and dominated by *Acer saccharinum*. Codominants may include *Populus deltoides, Platanus occidentalis, Ulmus americana, Ulmus rubra, Salix nigra, Acer negundo, Betula nigra, Celtis occidentalis*, and *Fraxinus pennsylvanica*. The shrub and sapling layer is often open (<25% cover). Species that may be present include *Sambucus canadensis* or *Lindera benzoin*. Woody and herbaceous vines can be prominent, including, among the woody vines, *Parthenocissus quinquefolia* and *Vitis riparia*. Herbaceous vines species include *Apios americana, Amphicarpaea bracteata*, and *Echinocystis lobata*. Herbaceous grasses, forbs, and ferns dominate the ground layer, including *Symphyotrichum lateriflorum (= Aster lateriflorus), Boehmeria cylindrica, Elymus virginicus, Impatiens pallida, Laportea canadensis, Matteuccia struthiopteris, Onoclea sensibilis, Pilea pumila, Urtica dioica*, and others. A variety of exotics may be present, including *Lysimachia* spp., *Microstegium vimineum*, and *Lonicera japonica*.

RANGE

Effigy Mounds National Monument

This community occurs along the Mississippi and Yellow Rivers.

Globally

This association is found throughout the midwestern United States and parts of the eastern United States, ranging from Pennsylvania west to Minnesota, south to Arkansas, and east to Virginia. It is a major, large-river floodplain forest community along the Potomac, Shenandoah, Rappahannock, and James rivers in Virginia.

ENVIRONMENTAL DESCRIPTION

Effigy Mounds National Monument

This association is found in regularly flooded bottomlands. Soils are typically inundated in the spring, becoming moderately well-drained later in the season in most years.

Globally

This community occurs on temporarily flooded soils along major rivers and smaller perennial streams. Soils may be well-drained and sandy, more loamy on infrequently flooded bottomlands and levees, or deep silts on stabilized sites along larger rivers. The structure and composition of the type is influenced by the flooding regime. Floods leave river-deposited debris on the forest floor, ice scars on trees, and abandoned channels that retain water at or above the level of the main river channel. ^In Virginia this community is restricted to large river floodplains generally <300 m (1000 feet) elevation. Sites are usually well-drained levees and elevated terraces with light-textured, sandy soils. Soil samples collected from plots were slightly acidic (mean pH = 6.5), with high calcium levels (mean = 2642 ppm). Habitats are temporarily inundated, annually or less often, in major flood events.

MOST ABUNDANT SPECIES

Effigy Mounds National Monument

Stratum	Species
TREE CANOPY	*Acer saccharinum*
FORB	*Laportea canadensis*
VINES/LIANA	*Vitis riparia*

Globally

Stratum	Species

CHARACTERISTIC SPECIES

Effigy Mounds National Monument

Acer saccharinum, Populus deltoides, Fraxinus pennsylvanica. Vitis riparia, Toxicodendron radicans, Pilea pumila, Laportea canadensis

Globally
Acer negundo, Acer saccharinum, Populus deltoides, Elymus virginicus, Alliaria petiolata, Conium maculatum, Glechoma hederacea, Urtica dioica ssp gracilis, Humulus japonicus

VEGETATION DESCRIPTION
Effigy Mounds National Monument
Acer saccharinum dominates the canopy, with 50% or greater relative cover. Codominants vary, but most stands have *Ulmus americana* as a prominent associate. Other species may include *Populus deltoides, Salix nigra, Acer negundo, Ulmus rubra*, and *Celtis occidentalis*. Woody and herbaceous vines are prominent features, including *Parthenocissus quinquefolia* and *Vitis riparia*. Some stands have *Quercus bicolor* as a codominant. In one stand at Sny Magill, scattered old *Quercus macrocarpa* trees share dominance with *Fraxinus pennsylvanica* and *Ulmus Americana.* This stand is considered a variant of this association. The herbaceous layer consists of *Laportea canadensis, Leersia virginica*, etc.

Globally
Canopy cover is more-or-less closed and dominated by *Acer saccharinum*. Codominants may include *Populus deltoides, Platanus occidentalis, Ulmus americana, Ulmus rubra, Salix nigra, Acer negundo, Betula nigra, Celtis occidentalis*, and *Fraxinus pennsylvanica*. The shrub and sapling layer is often open (<25% cover). Species that may be present include *Sambucus canadensis* or *Lindera benzoin*. Woody and herbaceous vines can be prominent, including, among the woody vines, *Parthenocissus quinquefolia* and *Vitis riparia*. Herbaceous vines species include *Apios americana, Amphicarpaea bracteata*, and *Echinocystis lobata*. Herbaceous grasses, forbs, and ferns dominate the ground layer, including *Symphyotrichum lateriflorum (= Aster lateriflorus), Boehmeria cylindrica, Elymus virginicus, Impatiens pallida, Laportea canadensis, Matteuccia struthiopteris, Onoclea sensibilis, Pilea pumila, Urtica dioica*, and others. A variety of exotics may be present, including *Lysimachia* spp., *Microstegium vimineum*, and *Lonicera japonica* (Anderson 1996, MNNHP 1993, Central Appalachian Ecoregional Team pers. comm., 1998). ^Virginia stands of this vegetation are typically dominated by *Acer saccharinum*, with *Acer negundo* dominating a subcanopy layer. *Acer negundo* or *Populus deltoides* occasionally dominate the canopy in even-aged, regenerating stands. Minor overstory and understory associates include *Celtis occidentalis, Fraxinus pennsylvanica, Ulmus americana*, and *Platanus occidentalis*. *Ulmus americana* was formerly more abundant as a canopy codominant but has been much reduced by Dutch elm disease. The shrub layer is often sparse, or sometimes moderately dense with *Lindera benzoin*. The herb layer exhibits seasonal patch-dominance of *Elymus virginicus* (early) and *Laportea canadensis* (late). Other frequent or locally abundant herbs are *Impatiens pallida, Viola sororia, Leersia virginica, Verbesina alternifolia, Urtica dioica ssp. gracilis, Elymus riparius, Galium aparine, Stachys tenuifolia, Symphyotrichum lanceolatum (= Aster lanceolatus)*, and *Cryptotaenia canadensis*. Small, scoured areas with exposed sand usually support suites of annuals such as *Pilea pumila, Acalypha rhomboidea, Acalypha deamii, Polygonum* spp., and *Bidens* spp. Fertile soils, combined with the dispersal opportunities afforded by large streams and the frequent agricultural use of floodplains and adjacent lands, contribute to rampant populations of invasive exotic weeds in this association. The most abundant of these include *Alliaria petiolata, Glechoma hederacea, Stellaria media, Humulus japonicus, Conium maculatum, Poa trivialis, Hesperis matronalis*, and *Polygonum caespitosum var. longisetum*. Species richness of plot-sampled stands ranges from 23 to 52 taxa per 400 m2 (mean = 41).

Anderson (1996) notes that *Celtis occidentalis, Gleditsia triacanthos*, and *Aesculus glabra* may be more common along the calcareous streams of western Ohio.

OTHER NOTEWORTHY SPECIES

CONSERVATION RANK G4? There has been significant conversion of stands to agriculture, hydrologic modifications due to river dams, etc., and siltation caused by modified flooding regimes.

DATABASE CODE CEGL002586

COMMENTS
Effigy Mounds National Monument
This community is the major floodplain forest community along the Mississippi River. Stands codominated by *Quercus bicolor* or *Q. macrocarpa* are remnants of a previously more diverse community that existed before the natural hydrograph and water tables were altered when the river was impounded.

Globally

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Note:
This association is found in four different map classes:

1) Maple phase
2) Hackberry phase
3) Swamp white oak phase
4) Bur oak phase

Populus deltoides - Salix nigra Forest

COMMON NAME	Eastern Cottonwood - Black Willow Forest
SYNONYM	Midwestern Cottonwood - Black Willow Forest
PHYSIOGNOMIC CLASS	Forest (I)
PHYSIOGNOMIC SUBCLASS	Deciduous forest (I.B)
PHYSIOGNOMIC GROUP	Cold-deciduous forest (I.B.2)
PHYSIOGNOMIC SUBGROUP	Natural/Semi-natural Cold-deciduous forest (I.B.2.N)
FORMATION	Temporarily flooded cold-deciduous forest (I.B.2.N.d)
ALLIANCE	POPULUS DELTOIDES TEMPORARILY FLOODED FOREST ALLIANCE

CLASSIFICATION CONFIDENCE LEVEL 2

USFWS WETLAND SYSTEM Temporarily flooded cold-deciduous forest

CONCEPT SUMMARY

Globally

This cottonwood - black willow forest is characteristic of the fronts and banks of most major rivers and streams throughout the Central Forest Region, extending into the northern forest particularly within the Mississippi, Ohio, and Missouri River systems. It develops on bare, moist soil on recently formed sand bars, front-land ridges, and well-drained flats, along with *Salix interior, Eragrostis hypnoides, Leptochloa panicea ssp. brachiata (= Leptochloa filiformis), Lipocarpha micrantha (= Hemicarpha micrantha), Rumex maritimus, Potentilla paradoxa*, and *Bidens* spp. This natural community can also be found on abandoned fields and well-drained ridges in the first bottoms. Soils are formed in alluvium, are deep, medium-textured, and with adequate or excessive moisture available for vegetation during the growing season. The tree canopy is tall (to 30 m) and dominated by *Populus deltoides* and *Salix nigra*, although *Fraxinus pennsylvanica, Acer saccharinum, Acer negundo, Platanus occidentalis*, and *Ulmus americana* are also commonly encountered. Tree diversity is limited due to the dynamics of flooding and resultant deposition and scouring of sediments. The subcanopy is almost exclusively *Salix nigra*. The shrub layer is conspicuously absent in many parts of the range. Herbaceous growth can be thick and lush but is often patchy and sparse due to frequent inundation. Species most often encountered in the ground layer include *Carex* spp., *Leersia oryzoides, Bidens* spp., and Asteraceae spp.

RANGE

Effigy Mounds National Monument

Globally

This cottonwood - black willow forest is characteristic of the fronts and banks of most major rivers and streams throughout the Central Forest Region, extending into the northern forest particularly within the Mississippi, Ohio, and Missouri River systems, extending from Ohio west to Minnesota, southward to Oklahoma, and east to Kentucky. This community once occupied vast tracts of land along river fronts and floodplain depressions. Land clearing, ditching and draining for conversion to cropland, and logging have eliminated much of the presettlement stands of this natural community.

ENVIRONMENTAL DESCRIPTION

Effigy Mounds National Monument

Globally

This community is quick to colonize newly deposited substrates adjacent to rivers, lakes, streams, and in frequently flooded, low, wet depressions in floodplains. Dynamic substrate availability caused by frequent flooding encourages the establishment and maintenance of this community type.

MOST ABUNDANT SPECIES

Effigy Mounds National Monument

Stratum	Species

Globally

Stratum	Species
TREE CANOPY	*Populus deltoides, Salix nigra*
TREE SUB-CANOPY	*Salix nigra*
GRAMINOID	*Carex typhina, Leersia oryzoides*
FORB	*Bidens aristosa, Spermacoce glabra, Symphyotrichum lanceolatum var lanceolatum, Symphyotrichum lateriflorum var lateriflorum*

CHARACTERISTIC SPECIES

Effigy Mounds National Monument

Globally

VEGETATION DESCRIPTION

Effigy Mounds National Monument

Vegetation of this type was not characterized during this project. However, based on observations, species likely to occur include *Populus deltoides*, *Salix nigra*, *Acer saccharinum*, and *Fraxinus pennsylvanica*.

Globally

This community is dominated by broadleaf deciduous trees. Canopy closure is complete, or nearly so, with few shrubs and limited tree species found in the type. The tree canopy is tall (to 30 m) and dominated by *Populus deltoides* and *Salix nigra*, although *Fraxinus pennsylvanica, Acer saccharinum, Acer negundo, Platanus occidentalis*, and *Ulmus americana* are also commonly encountered. Tree diversity is limited due to the dynamics of flooding and deposition/scouring of sediments. The subcanopy is almost exclusively *Salix nigra*. The shrub layer is conspicuously absent in many parts of the range. Herbaceous growth can be thick and lush but is often patchy and sparse due to frequent inundation. Species most often encountered in the ground layer include *Carex* spp., *Leersia oryzoides, Bidens* spp., and Asteraceae spp. (TNC 1995a).

Species composition is uniform throughout the range of this community. Species density is governed by the duration and depth of flooding. The more stable sites display very large cottonwood trees with lush understory and herbaceous layers. Sites frequently affected by flooding exhibit dense even-aged stands of cottonwood and willow. This forest often has considerable deposits of woody debris and high tree mortality.

OTHER NOTEWORTHY SPECIES

CONSERVATION RANK G3G4. The current range of this community is much smaller than the presettlement range due to extensive logging, ditching, draining, and land clearing for conversion to croplands. The reduced water flows and channelization of rivers decreases the frequency of natural floods necessary for the scouring and deposition of new substrates that favor cottonwood regeneration.

DATABASE CODE CEGL002018

COMMENTS

Effigy Mounds National Monument

Globally

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Salix interior Temporarily Flooded Shrubland

COMMON NAME	Sandbar Willow Temporarily Flooded Shrubland
SYNONYM	Sandbar Willow Shrubland
PHYSIOGNOMIC CLASS	Shrubland (III)
PHYSIOGNOMIC SUBCLASS	Deciduous shrubland (III.B)
PHYSIOGNOMIC GROUP	Cold-deciduous shrubland (III.B.2)
PHYSIOGNOMIC SUBGROUP	Natural/Semi-natural Cold-deciduous shrubland (III.B.2.N)
FORMATION	Temporarily flooded cold-deciduous shrubland (III.B.2.N.d)
ALLIANCE	SALIX (EXIGUA, INTERIOR) TEMPORARILY FLOODED SHRUBLAND ALLIANCE

CLASSIFICATION CONFIDENCE LEVEL 2

USFWS WETLAND SYSTEM Temporarily flooded cold-deciduous shrubland

CONCEPT SUMMARY

Globally

This willow shrubland community is found scattered along rivers and streams at lower elevations in parts of the midwestern United States, the Mississippi River Alluvial Plain, and the Appalachians. This type represents an early successional stage of temporarily flooded riparian vegetation that occurs most commonly on alluvial sands. The substrate may also contain silts, clays, and/or gravels. The canopy is dominated by *Salix interior*, which can form dense stands up to 4 m tall. There are often areas where the shrub layer is absent. Seedlings and small saplings of *Populus deltoides* or *Platanus occidentalis* may be present. The herbaceous cover is sparse to moderate, but rarely exceeds 30%. Species present include *Polygonum lapathifolium, Eupatorium* spp., *Schoenoplectus americanus (= Scirpus americanus)*, and *Xanthium strumarium*. The composition of this community, especially the herbaceous layer, varies from year to year with succession or renewed disturbance.

RANGE

Effigy Mounds National Monument

This community occurs as small stands bordering ponds and along the Yellow and Mississippi Rivers.

Globally

This sandbar willow shrubland community is found along rivers and streams at lower elevations in parts of the midwestern United States and parts of the Appalachians, ranging sporadically from South Dakota, Nebraska, Iowa, and Illinois south to Oklahoma and Arkansas, and northeast at least to Kentucky. The species ranges north into Canada (Kartesz 1999), but there is no information indicating that it forms stands worthy of recognition as a community anywhere northeast of Kentucky.

ENVIRONMENTAL DESCRIPTION

Effigy Mounds National Monument

This community develops where sand or silt deposits have been deposited. Flooding is common in the spring.

Globally

This community is found on recently deposited or disturbed alluvial material. The parent material is alluvial sand, although silt, clay, or gravel may be present. Soil development is poor to absent.

MOST ABUNDANT SPECIES

Effigy Mounds National Monument

Stratum	Species
TALL SHRUB	*Salix interior*

Globally

Stratum	Species

CHARACTERISTIC SPECIES

Effigy Mounds National Monument

Salix interior

Globally

VEGETATION DESCRIPTION

Effigy Mounds National Monument

Salix interior dominates the shrub layer, forming dense stands the 3–4m tall. Herbaceous species are somewhat sparse, with total cover < 25%, but this layer probably varies depending on presence or absence of disturbance. Species present include *Equisetum fluviatilis, Laportea canadensis, Sichyos lobata, Carex lacustris, Pilea pumila, and Leersia oryzoides*.

Globally
This community is dominated by shrubs, generally between 2 and 4 m tall. The most abundant of these is *Salix interior*. Saplings of *Populus deltoides* or *Platanus occidentalis* are also frequently found in the shrub layer. This stratum can have moderate to high stem density in overall composition of the community. The species in the shrub layer do not form a closed canopy, this allows significant light to reach the ground layer. Patches are also frequently found where the shrub layer is absent. The herbaceous cover is sparse to moderate, but rarely exceeds 30%. Older stands and places with less competition from the shrubs may have greater herbaceous cover. The composition of the herbaceous layer can vary greatly; species that are often found in this community include *Polygonum lapathifolium, Eupatorium* spp., *Schoenoplectus americanus (= Scirpus americanus)*, and *Xanthium strumarium*.

OTHER NOTEWORTHY SPECIES

CONSERVATION RANK G4G5. This type is moderately widespread and common throughout its range.

DATABASE CODE CEGL008562

COMMENTS
Effigy Mounds National Monument
Although this type is common along side channels of the Mississippi River, it is of rare occurrence at EFMO.

Globally

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Cephalanthus occidentalis / *Carex* spp. Northern Shrubland

COMMON NAME	Buttonbush / Sedge species Northern Shrubland
SYNONYM	Northern Buttonbush Swamp
PHYSIOGNOMIC CLASS	Shrubland (III)
PHYSIOGNOMIC SUBCLASS	Deciduous shrubland (III.B)
PHYSIOGNOMIC GROUP	Cold-deciduous shrubland (III.B.2)
PHYSIOGNOMIC SUBGROUP	Natural/Semi-natural Cold-deciduous shrubland (III.B.2.N)
FORMATION	Semipermanently flooded cold-deciduous shrubland (III.B.2.N.f)
ALLIANCE	CEPHALANTHUS OCCIDENTALIS SEMIPERMANENTLY FLOODED SHRUBLAND ALLIANCE

CLASSIFICATION CONFIDENCE LEVEL 2

USFWS WETLAND SYSTEM Semipermanently flooded cold-deciduous shrubland

CONCEPT SUMMARY

Globally

This buttonbush swamp shrubland community occurs throughout glaciated regions of the midwestern and northeastern United States and adjacent Canada. Stands occupy shallow water depressions, oxbow ponds, and backwater sloughs of stream and river floodplains. Inundation is usually continuous throughout the year, but these sites can become dry in mid or late summer or during periods of prolonged drought. Soils are deep (>100 cm) consisting of peat or muck over alluvial parent material. The shrub layer can vary from very open to closed (20–80%). *Cephalanthus occidentalis* typically comprises nearly 90% of the shrub layer in waters 1–2 m deep. Other shrubs commonly encountered include *Cornus sericea, Decodon verticillatus, Ilex verticillata, Rosa palustris*, and *Salix nigra*. The herbaceous layer can be very sparse, due to flooding. Rooted or floating aquatics may dominate, including *Lemna minor* and *Nuphar lutea ssp. advena*. Herbs present on the shallow margins include *Bidens frondosa, Boehmeria cylindrica, Carex lacustris, Glyceria striata*, and others. A scattered tree canopy may occur, including the following species: *Acer rubrum, Acer saccharinum, Fraxinus nigra, Fraxinus pennsylvanica*, and *Ulmus americana*. Diagnostic features include the dominance by *Cephalanthus occidentalis* in glaciated regions and, typically, the presence of standing water.

RANGE

Effigy Mounds National Monument

This community occurs in backwater sloughs of the Mississippi and Yellow Rivers, and along the edges of ponds.

Globally

This buttonbush swamp shrubland community occurs throughout glaciated regions of the midwestern and northeastern United States and adjacent Canada, ranging from northern Missouri north to southern Michigan, east to Ohio and southern Ontario, and south to Indiana and Illinois.

ENVIRONMENTAL DESCRIPTION

Effigy Mounds National Monument

This community occupies wet edges of ponds and in shallow waters of backwater sloughs. Soils are muck, and are usually inundated continuously through the year, except in periods of prolonged drought. Water depth varies throughout the season, ranging from > 1m to .5m.

Globally

This wet shrubland community occupies shallow water depressions, oxbow ponds, and backwater sloughs of stream and river floodplains throughout swampy forested areas in glaciated terrain. Inundation is usually continuous throughout the year, but these sites can become dry in mid or late summer or during periods of prolonged drought (Faber-Langendoen and Maycock 1989). Soils are deep (>100 cm) consisting of peat or muck over alluvial parent material.

MOST ABUNDANT SPECIES

Effigy Mounds National Monument

Stratum	Species
TALL SHRUB	*Cephalanthus occidentalis*

Globally

Stratum	Species

CHARACTERISTIC SPECIES

Effigy Mounds National Monument

Cephalanthus occidentalis

Globally

VEGETATION DESCRIPTION

Effigy Mounds National Monument

Cephalanthus comprises 90–100 % of the shrub layer. Shrub canopy cover can be either open or closed. *Acer saccharinum* may be scattered in the tree and shrub layers. Herbaceous species present include *Sagittaria latifolia, Laportea canadensis, Phalaris arundinacea, and Scirpus fluviatilis*. However, the herbaceous layer can be absent during years with prolonged flooding..

Globally

The shrub layer can vary from very open to closed (20–80%). *Cephalanthus occidentalis* typically comprises nearly 90% of the shrub layer in waters 1–2 m deep. Other shrubs commonly encountered include *Cornus sericea, Decodon verticillatus, Ilex verticillata, Rosa palustris*, and *Salix nigra*. The herbaceous layer can be very sparse, due to flooding. Rooted or floating aquatics may dominate, including *Lemna minor* and *Nuphar lutea ssp. advena (= Nuphar advena)*. Herbs present on the shallow margins include *Bidens frondosa, Boehmeria cylindrica, Carex lacustris, Glyceria striata*, and others. In Missouri *Hibiscus laevis (= Hibiscus militaris)* is common. A scattered tree canopy may occur, including the following species: *Acer rubrum, Acer saccharinum, Fraxinus nigra, Fraxinus pennsylvanica*, and *Ulmus americana* (Anderson 1996, Faber-Langendoen and Maycock 1989).

OTHER NOTEWORTHY SPECIES

CONSERVATION RANK G4.

DATABASE CODE CEGL002190

COMMENTS

Effigy Mounds National Monument

This is a rare community within the Monument, occurring in small stands in abandoned channels of bottomlands and floodplain islands, or as a fringe community at the edges of ponds. It is of common occurrence in the nearby Mississippi River floodplain.

Globally

REFERENCES

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Phalaris arundinacea Eastern Herbaceous Vegetation

COMMON NAME	Reed Canary Grass Eastern Herbaceous Vegetation
SYNONYM	Reed Canary Grass Eastern Marsh
PHYSIOGNOMIC CLASS	Herbaceous Vegetation (V)
PHYSIOGNOMIC SUBCLASS	Perennial graminoid vegetation (V.A)
PHYSIOGNOMIC GROUP	Temperate or subpolar grassland (V.A.5)
PHYSIOGNOMIC SUBGROUP	Natural/Semi-natural Temperate or subpolar grassland (V.A.5.N)
FORMATION	Seasonally flooded temperate or subpolar grassland (V.A.5.N.k)
ALLIANCE	PHALARIS ARUNDINACEA SEASONALLY FLOODED HERBACEOUS ALLIANCE

CLASSIFICATION CONFIDENCE LEVEL 2

USFWS WETLAND SYSTEM Seasonally flooded temperate or subpolar grassland

CONCEPT SUMMARY

Globally

This association is found throughout the northeastern United States and Canada, but its distribution as a natural type is complicated elsewhere. It is native to the United States and Canada, but is now more widely distributed and abundant because of local introductions from both local and European populations. The introduced strains may be a more aggressive ecotype than native strains. Stands are found in both minerotrophic basin wetlands as well as river shores. It has been widely used as a forage and hay crop, especially in marshes and floodplains, and is used for wildlife food, for shoreline and ditch stabilization. Stands are dominated by *Phalaris arundinacea*, a 0.5–2-m tall perennial grass, which tends to occur in monocultures or associated with *Calamagrostis canadensis*. Other associates in the northeast include *Viburnum nudum, Alnus incana* or *Alnus serrulata, Viburnum dentatum*, and *Agrostis gigantea*. Midwest associates include species characteristic of wet meadows. *Phalaris arundinacea* can displace native species over time. Further work is required to resolve the natural versus introduced nature of this type in the southeast before a description can be completed.

RANGE

Effigy Mounds National Monument

This community is found along the Mississippi and Yellow Rivers.

Globally

This association is found throughout the northeastern United States and Canada, but its distribution as a natural type is complicated elsewhere. It currently ranges from Virginia north to Vermont, east to Minnesota and south to Tennessee.

ENVIRONMENTAL DESCRIPTION

Effigy Mounds National Monument

This community is found on terraces of the Yellow River, and along shores and on islands in the nearby backwaters of the Mississippi River.

Globally

Stands are found in both minerotrophic basin wetlands as well as river shores. It has been widely used as a forage and hay crop, especially in marshes and floodplains, and is used for wildlife food, for shoreline and ditch stabilization (Barnes 1999).

MOST ABUNDANT SPECIES

Effigy Mounds National Monument

Stratum	Species
HERBACEOUS	*Phalaris arundinacea*

Globally

Stratum	Species

CHARACTERISTIC SPECIES

Effigy Mounds National Monument

Phalaris arundinacea

Globally

VEGETATION DESCRIPTION

Effigy Mounds National Monument

Phalaris forms near monotypic stands. Bottomland hardwood tree species such as *Fraxinus pennslyvanica* or *Ulmus* spp. may be present at very low cover. Herbaceous species characteristic of wet meadows may also be present.

Globally
Stands are dominated by *Phalaris arundinacea*, a 0.5–2-m tall perennial grass that is native to the United States and Canada, but which has also been introduced from European strains. The introduced strains may be a more aggressive ecotype than native strains (Barnes 1999). It tends to occur in monocultures or associated with *Calamagrostis canadensis*. Other associates in the Northeast include *Viburnum nudum, Alnus incana* or *Alnus serrulata, Viburnum dentatum*, and *Agrostis gigantea*. Midwest associates include species characteristic of wet meadows. *Phalaris arundinacea* can displace native species over time (Apfelbaum and Sams 1987, Barnes 1999, and references therein). Further work is required to resolve the natural versus introduced nature of this type in the Southeast before a description can be completed.

OTHER NOTEWORTHY SPECIES

CONSERVATION RANK GW.

DATABASE CODE CEGL006044

COMMENTS
Effigy Mounds National Monument
Phalaris stands are similar to some degraded *Acer saccharinum* stands where the tree cover is low.

Globally

REFERENCES
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Schoenoplectus fluviatilis - Schoenoplectus spp. Herbaceous Vegetation

COMMON NAME	River Bulrush - Clubrush species Herbaceous Vegetation
SYNONYM	River Bulrush Marsh
PHYSIOGNOMIC CLASS	Herbaceous Vegetation (V)
PHYSIOGNOMIC SUBCLASS	Perennial graminoid vegetation (V.A)
PHYSIOGNOMIC GROUP	Temperate or subpolar grassland (V.A.5)
PHYSIOGNOMIC SUBGROUP	Natural/Semi-natural Temperate or subpolar grassland (V.A.5.N)
FORMATION	Seasonally flooded temperate or subpolar grassland (V.A.5.N.k)
ALLIANCE	SCHOENOPLECTUS FLUVIATILIS SEASONALLY FLOODED HERBACEOUS ALLIANCE

CLASSIFICATION CONFIDENCE LEVEL 3

USFWS WETLAND SYSTEM Seasonally flooded temperate or subpolar grassland

CONCEPT SUMMARY

Globally

This community is found throughout the central and upper midwestern United States where it is found along large rivers and lakeshores. Sites are subject to seasonal flooding that typically draws down by late summer. The diagnostic dominant is *Schoenoplectus fluviatilis (= Scirpus fluviatilis)*, which often forms almost mono-dominant patches. Other marsh associates include *Typha angustifolia, Typha latifolia, Schoenoplectus tabernaemontani (= Scirpus tabernaemontani)*, and *Sparganium eurycarpum*.

RANGE

Effigy Mounds National Monument

This community is found along ponds and in backwaters of the Mississippi River.

Globally

This community is found throughout the central and upper midwestern United States where it is found along large rivers and lakeshores, ranging from Ohio west to Manitoba and south to Iowa.

ENVIRONMENTAL DESCRIPTION

Effigy Mounds National Monument

This community is found along shallow margins of ponds, and in shallow backwaters of the Mississippi River. The substrate is muck and water depth is <1 meter.

Globally

Sites are subject to seasonal flooding that typically draws down by late summer.

MOST ABUNDANT SPECIES

Effigy Mounds National Monument

Stratum	Species
FORB	*Schoenoplectus fluviatilis*

Globally

Stratum	Species

CHARACTERISTIC SPECIES

Effigy Mounds National Monument

Globally

VEGETATION DESCRIPTION

Effigy Mounds National Monument

Schoenoplectu fluviatilis forms a monospecific stand. Other herbaceous species present may include *Scirpus validus*, *Leersia oryzoides*, and *Polygonum coccinium*. Where open patches of water exist, submersed aquatic plants and *Lemna* spp occur. Submersed species include *Elodea canadensis*, narrow-leaved pondweeds (*Potamogeton* spp.), and *Lemna* spp (*trisulca, minor*).

Globally

The diagnostic dominant is *Schoenoplectus fluviatilis (= Scirpus fluviatilis)*, which often forms almost mono-dominant patches. Other marsh associates include *Typha angustifolia, Typha latifolia, Schoenoplectus tabernaemontani (= Scirpus tabernaemontani)*, and *Sparganium eurycarpum*.

OTHER NOTEWORTHY SPECIES

CONSERVATION RANK G3G4. In the northern tallgrass prairie, these marshes can be heavily degraded due to heavy siltation, nutrient enrichment, and plowed floodplains (R. Dana pers. comm. 1999). In the Mississippi River floodplains, extensive stands once occurred, but they are now subject to very altered hydrologic regimes (since the 1930s) (Eric Epstein pers. comm. 1999).

DATABASE CODE CEGL002221

COMMENTS
Effigy Mounds National Monument

Globally

REFERENCES

Schoenoplectus tabernaemontani - *Typha* spp. - (*Sparganium* spp., *Juncus* spp.) Herbaceous Vegetation

COMMON NAME	Softstem Bulrush - Cattail species - (Bur-reed species, Rush species) Herbaceous Vegetation
SYNONYM	Bulrush - Cattail - Burreed Shallow Marsh
PHYSIOGNOMIC CLASS	Herbaceous Vegetation (V)
PHYSIOGNOMIC SUBCLASS	Perennial graminoid vegetation (V.A)
PHYSIOGNOMIC GROUP	Temperate or subpolar grassland (V.A.5)
PHYSIOGNOMIC SUBGROUP	Natural/Semi-natural Temperate or subpolar grassland (V.A.5.N)
FORMATION	Seasonally flooded temperate or subpolar grassland (V.A.5.N.k)
ALLIANCE	TYPHA SPP. - (SCHOENOPLECTUS SPP., JUNCUS SPP.) SEASONALLY FLOODED HERBACEOUS ALLIANCE

CLASSIFICATION CONFIDENCE LEVEL 3

USFWS WETLAND SYSTEM Seasonally flooded temperate or subpolar grassland

CONCEPT SUMMARY

Globally

This shallow marsh mixed emergent community ranges broadly over the midwestern United States and adjacent Canada. It is found in basin-like depressions, backwater areas of floodplains, and shallow margins of lakes or ponds. Soils are shallow to deep, very poorly drained, consisting of peats, mucks, or mineral materials, often found in alluvium. Vegetation varies from zones dominated by tall emergents 1–2 m tall to those with hydrophytic annual and perennial forbs <1 m tall. In the tall emergent zone, *Schoenoplectus tabernaemontani (= Scirpus tabernaemontani), Schoenoplectus fluviatilis (= Scirpus fluviatilis), Schoenoplectus acutus (= Scirpus acutus), Typha angustifolia*, and *Typha latifolia* may dominate, mixed with a variety of other herbaceous species, such as *Leersia oryzoides, Eleocharis palustris, Juncus* spp., and *Sparganium* spp. The hydrophytic annual and perennial forb zone is dominated by *Alisma subcordatum, Alisma plantago-aquatica, Sagittaria latifolia, Sparganium eurycarpum, Pontederia cordata*, along with *Bacopa rotundifolia* and *Heteranthera limosa*. Occasional floating-leaved aquatics are sometimes present, including *Azolla caroliniana, Lemna* spp., *Spirodela polyrrhiza*, and *Utricularia macrorhiza*.

RANGE

Effigy Mounds National Monument

This community occurs along ponds within the Monument and in backwaters of the nearby backwaters of the Mississippi River.

Globally

This shallow marsh mixed emergent community ranges broadly over the midwestern United States and adjacent Canada, from Ohio and Ontario west to Manitoba, south to Oklahoma, and east to Indiana.

ENVIRONMENTAL DESCRIPTION

Effigy Mounds National Monument

This community is found along shallow margins of ponds, and in shallow backwaters of the Mississippi River. The substrate is muck and water depth is less than 1 meter. *Sparganium eurycarpum,* may form monospecific stands.

Globally

This community ranges broadly over the midwestern United States. It is found in basin-like depressions, backwater areas of floodplains and shallow margins of lakes or ponds. Soils are shallow to deep, very poorly drained, consisting of peats, mucks, or mineral materials, often found in alluvium (Lauver et al. 1999).

MOST ABUNDANT SPECIES

Effigy Mounds National Monument

Stratum	Species
FORB	*Sparganium eurycarpum*

Globally

Stratum	Species

CHARACTERISTIC SPECIES

Effigy Mounds National Monument

Sparganium eurycarpum

Globally

VEGETATION DESCRIPTION

Effigy Mounds National Monument

Sparganium eurycarpum forms a near monospecific stand. Other herbaceous species present may include *Scirpus validus* and *Polygonum coccinium.* Where open patches of water exist, submersed aquatic plants and *Lemna* spp occur. Submersed species include *Elodea canadensis*, narrow-leaved pondweeds (*Potamogeton* spp.), and *Lemna* spp (*trisulca, minor*).

Globally

Vegetation varies from zones dominated by tall emergents 1–2 m tall to those with hydrophytic annual and perennial forbs <1 m tall. In the tall emergent zone, *Schoenoplectus tabernaemontani (= Scirpus tabernaemontani), Schoenoplectus fluviatilis (= Scirpus fluviatilis), Schoenoplectus acutus (= Scirpus acutus), Typha angustifolia*, and *Typha latifolia* may dominate, mixed with a variety of other herbaceous species, such as *Leersia oryzoides, Eleocharis palustris, Juncus* spp., and *Sparganium* spp. The hydrophytic annual and perennial forb zone is dominated by *Alisma subcordatum, Alisma plantago-aquatica, Pontederia cordata, Sagittaria latifolia*, and *Sparganium eurycarpum*, along with *Bacopa rotundifolia* and *Heteranthera limosa*. Other species that may dominate locally include *Polygonum pensylvanicum (= Polygonum bicorne), Polygonum amphibium var. emersum (= Polygonum coccineum)*, and *Polygonum lapathifolium*. Occasional floating-leaved aquatics are sometimes present, including *Azolla caroliniana, Lemna* spp., *Spirodela polyrrhiza*, and *Utricularia macrorhiza* (Eggers and Reed 1987, Steinauer and Rolfsmeier 2000).

OTHER NOTEWORTHY SPECIES

CONSERVATION RANK G4G5.

DATABASE CODE CEGL002026

COMMENTS

Effigy Mounds National Monument

This is a rare community type within the Monument, but is common in backwaters of the Mississippi River.

Globally

REFERENCES

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Sagittaria latifolia - Leersia oryzoides Herbaceous Vegetation

COMMON NAME	Broadleaf Arrowhead - Rice Cutgrass Herbaceous Vegetation
SYNONYM	Arrowhead - Rice Cutgrass Marsh
PHYSIOGNOMIC CLASS	Herbaceous Vegetation (V)
PHYSIOGNOMIC SUBCLASS	Perennial forb vegetation (V.B)
PHYSIOGNOMIC GROUP	Temperate or subpolar perennial forb vegetation (V.B.2)
PHYSIOGNOMIC SUBGROUP	Natural/Semi-natural Temperate or subpolar perennial forb vegetation (V.B.2.N)
FORMATION	Semipermanently flooded temperate perennial forb vegetation (V.B.2.N.e)
ALLIANCE	SAGITTARIA LATIFOLIA SEMIPERMANENTLY FLOODED HERBACEOUS ALLIANCE

CLASSIFICATION CONFIDENCE LEVEL 3

USFWS WETLAND SYSTEM Semipermanently flooded temperate perennial forb vegetation

CONCEPT SUMMARY

Globally

This arrowhead marsh type is found in the midwestern United States mostly along larger floodplains such as the Mississippi River and its larger tributaries. Stands occur in semipermanently flooded wetlands dominated by *Sagittaria latifolia* and/or *Leersia oryzoides*. In examples of this type, Leeris oryzoides typically occurs in more shallow areas or where the water recedes enough to allow it to establish, but not inhibit, *Sagittaria latifolia*. Other emergent aquatic species such as *Potamogeton* spp. and *Ceratophyllum demersum* are also often present. Although this type can occur naturally, many examples along major waterways can be impacted by dams and/or impoundments. Examples of this community may become monospecific stands of either *Sagittairia latifolia* or *Leersia oryzoides*, especially in areas above dam along major rivers where the environment can be more lacustrine in natures. More information is needed to determine the range of this type outside of the upper Midwest.

RANGE

Effigy Mounds National Monument

This type if found in backwaters of the Mississippi River.

Globally

This type is found in the midwestern United States, but is poorly described, so its range is not well understood.

ENVIRONMENTAL DESCRIPTION

Effigy Mounds National Monument

This type occurs along shorelines in quiet backwaters of the Mississippi River.

Globally

Stands occur in semipermanently flooded wetlands.

MOST ABUNDANT SPECIES

Effigy Mounds National Monument

Stratum	Species
FORB	*Sagittaria latifolia, Leersia oryzoides*

Globally

Stratum	Species

CHARACTERISTIC SPECIES

Effigy Mounds National Monument

Sagittaria latifolia, Leersia oryzoides

Globally

VEGETATION DESCRIPTION

Effigy Mounds National Monument

Sagittaria latifolia or Leersia oryzoides form nearly monospecific stands, or as mixed stands. Submersed aquatic plants and *Lemna* spp occur.where open patches of water exist. Submersed species include *Elodea canadensis*, narrow-leaved pondweeds (*Potamogeton* spp.), and *Lemna* spp (*trisulca, minor*).

Globally

Stands are dominated by *Sagittaria latifolia*, often with other emergent aquatic species. Little is known about the dynamics, naturalness, or composition of this association.

OTHER NOTEWORTHY SPECIES

CONSERVATION RANK G?.

DATABASE CODE CEGL005240

COMMENTS
Effigy Mounds National Monument

Globally

REFERENCES

Note:
This association is found in two different map classes:

1) Rice cutgrass phase
2) Arrowhead phase

Potamogeton spp. - *Ceratophyllum* spp. Midwest Herbaceous Vegetation

COMMON NAME	Pondweed species - Coontail species Midwest Herbaceous Vegetation
SYNONYM	Midwest Pondweed Submerged Aquatic Wetland
PHYSIOGNOMIC CLASS	Herbaceous Vegetation (V)
PHYSIOGNOMIC SUBCLASS	Hydromorphic rooted vegetation (V.C)
PHYSIOGNOMIC GROUP	Temperate or subpolar hydromorphic rooted vegetation (V.C.2)
PHYSIOGNOMIC SUBGROUP	Natural/Semi-natural Temperate or subpolar hydromorphic-rooted vegetation (V.C.2.N)
FORMATION	Permanently flooded temperate or subpolar hydromorphic rooted vegetation (V.C.2.N.a)
ALLIANCE	POTAMOGETON SPP. - CERATOPHYLLUM SPP. - ELODEA SPP. PERMANENTLY FLOODED HERBACEOUS ALLIANCE

CLASSIFICATION CONFIDENCE LEVEL 3

USFWS WETLAND SYSTEM Permanently flooded temperate or subpolar hydromorphic rooted vegetation

CONCEPT SUMMARY

Globally

This broadly defined submerged aquatic or open marsh type is found throughout the midwestern region of the United States and adjacent Canada. Based on information in the northern parts of the Midwest, several vegetation subgroups can be recognized that may be separate associations. Subgroup A is a shallow (<50 cm), sparsely vegetated, open water marsh found on sand, or organic and mineral material trapped in rocky bottoms. Stands are often exposed to wave action and found in oligotrophic lakes. Dominant plants often have basal rosettes that are resistant to wave action. Typical species include *Elatine minima, Eriocaulon aquaticum, Gratiola aurea, Isoetes tenella (= Isoetes echinospora), Isoetes lacustris (= Isoetes macrospora), Juncus pelocarpus*, and *Lobelia dortmanna*. Subgroup B is a shallow (<50 cm) open water marsh with emergent cover <25% and floating-leaved aquatics >25%. Substrate is a mineral soil (often sand), boulders, or a mixture of sedimentary peat and fine mineral soil. Stands can be exposed to waves or are in stream channels. Stands may often be dominated by a single species. Typical dominants include *Eleocharis acicularis, Myriophyllum* spp., *Potamogeton amplifolius, Potamogeton gramineus, Potamogeton praelongus, Potamogeton robbinsii, Sparganium fluctuans*, and *Utricularia macrorhiza (= Utricularia vulgaris)*. Subgroup C includes open water marsh with emergent cover <25% and floating leaved aquatics >25%. Substrate is sedimentary peat and stands are often found in sheltered bays of lakes and streams that do not have high wave energy. Stands may often be dominated by a single species. Typical dominants include *Ceratophyllum demersum, Lemna* spp., *Myriophyllum sibiricum, Myriophyllum verticillatum, Potamogeton natans, Stuckenia pectinata (= Potamogeton pectinatus), Potamogeton richardsonii, Potamogeton zosteriformis, Ranunculus aquatilis, Utricularia macrorhiza (= Utricularia vulgaris)*, and *Vallisneria americana*.

RANGE

Effigy Mounds National Monument

This community occurs in Founders Pond, and is widespread nearby in backwaters of the Mississippi River.

Globally

This pondweed submerged aquatic type is found widely throughout the midwestern United States and adjacent Canada, ranging from Ohio and Ontario west to North Dakota and south to Iowa.

ENVIRONMENTAL DESCRIPTION

Effigy Mounds National Monument

This community type occurs in shallow water of ponds. The substrate is muck and water depth is 1–1.5 m.

Globally

Curtis (1959) [see also Swindale and Curtis (1955)] noted that the major environmental controls on submerged aquatic vegetation are water depth (as it relates to light intensity), water chemistry, water movement, and nature of the substrate. Various combinations of these factors can interact in a variety of ways to influence the local composition of the community. As a result, a single lake may contain a number of relatively homogeneous stands, each with a different species makeup, which depends on depth, nature of adjoining shoreline, degree of protection from waves, etc. Water chemistry may be one of the few constants. Assessment of water conductivity and alkalinity are two measured parameters that can provide some understanding of the influence of water chemistry on species composition.

MOST ABUNDANT SPECIES

Effigy Mounds National Monument

Stratum	Species
FORB	*Ceratophyllum demersum, Elodea canadensis, Potamogeton crispus*

Globally

Stratum	Species

CHARACTERISTIC SPECIES
Effigy Mounds National Monument
Ceratophyllum demersum, Elodea canadensis, Potamogeton crispus

Globally

VEGETATION DESCRIPTION
Effigy Mounds National Monument
This community is an open water marsh dominated by submersed aquatic vegetation.

Globally
Based on information in the northern parts of the Midwest, several vegetation subgroups can be recognized that may be separate associations. Subgroup A is a shallow (<50 cm), sparsely vegetated, open-water marsh found on sand, or organic and mineral material trapped in rocky bottoms. Stands are often exposed to wave action and found in oligotrophic lakes. Dominant plants often have basal rosettes that are resistant to wave action. Typical species include *Elatine minima, Eriocaulon aquaticum, Gratiola aurea, Isoetes tenella (= Isoetes echinospora), Isoetes lacustris (= Isoetes macrospora), Juncus pelocarpus*, and *Lobelia dortmanna* (Curtis 1959, Harris et al. 1996). Subgroup B is a shallow (<50 cm), open-water marsh with emergent cover <25% and floating-leaved aquatics >25%. Substrate is a mineral soil (often sand), boulders, or a mixture of sedimentary peat and fine mineral soil. Stands can be exposed to waves or are in stream channels. Stands may often be dominated by a single species. Typical dominants include *Eleocharis acicularis, Myriophyllum* spp., *Potamogeton amplifolius, Potamogeton gramineus, Potamogeton praelongus, Potamogeton robbinsii, Sparganium fluctuans*, and *Utricularia macrorhiza (= Utricularia vulgaris)*. Subgroup C includes open-water marsh with emergent cover <25% and floating-leaved aquatics >25%. Substrate is sedimentary peat, and stands are often found in sheltered bays of lakes and streams that do not have high wave energy. Stands may often be dominated by a single species. Typical dominants include *Ceratophyllum demersum, Lemna* spp., *Myriophyllum sibiricum, Myriophyllum verticillatum, Potamogeton natans, Stuckenia pectinata (= Potamogeton pectinatus), Potamogeton richardsonii, Potamogeton zosteriformis, Ranunculus aquatilis, Utricularia macrorhiza (= Utricularia vulgaris)*, and *Vallisneria americana* (Curtis 1959, Harris et al. 1996).

OTHER NOTEWORTHY SPECIES

CONSERVATION RANK G5.

DATABASE CODE CEGL002282

COMMENTS
Effigy Mounds National Monument

Globally

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Nelumbo lutea Herbaceous Vegetation

COMMON NAME	American Lotus Herbaceous Vegetation
SYNONYM	American Lotus Aquatic Wetland
PHYSIOGNOMIC CLASS	Herbaceous Vegetation (V)
PHYSIOGNOMIC SUBCLASS	Hydromorphic rooted vegetation (V.C)
PHYSIOGNOMIC GROUP	Temperate or subpolar hydromorphic rooted vegetation (V.C.2)
PHYSIOGNOMIC SUBGROUP	Natural/Semi-natural Temperate or subpolar hydromorphic-rooted vegetation (V.C.2.N)
FORMATION	Permanently flooded temperate or subpolar hydromorphic rooted vegetation (V.C.2.N.a)
ALLIANCE	NELUMBO LUTEA PERMANENTLY FLOODED TEMPERATE HERBACEOUS ALLIANCE

CLASSIFICATION CONFIDENCE LEVEL 1

USFWS WETLAND SYSTEM Permanently flooded temperate or subpolar hydromorphic rooted vegetation

CONCEPT SUMMARY

Globally

The American lotus type occurs in natural wetlands or artificial impoundments across the eastern United States and southern Ontario. Stands are essentially monospecific *Nelumbo lutea* communities. This association may be divided as more information becomes available. In Wisconsin, this type is located primarily in the backwaters and impoundments of the Mississippi River and along the deep marshes of the lower Wolf River system. In the Central Appalachians this association includes mixed or monospecific *Nelumbo lutea* communities of natural wetlands or artificial impoundments, sometimes with scattered *Cephalanthus occidentalis*. Other floating-leaved aquatic plant species, such as *Nuphar lutea* and *Nymphaea odorata*, may be present, as may emergent species such as *Schoenoplectus tabernaemontani (= Scirpus tabernaemontani), Pontederia cordata, Juncus effusus, Typha latifolia, Eichhornia crassipes* (alien), *Hydrocotyle* spp., and floating aquatics, such as *Salvinia minima, Spirodela* spp., *Lemna* spp., and *Azolla caroliniana*. The hydrology of this association is highly variable; the hydrologic placement is debatable.

RANGE

Effigy Mounds National Monument

This community occurs in backwaters of the Mississippi River near Sny Magill.

Globally

This type is found locally across many parts of the eastern/southeastern United States, from Kentucky and Virginia northeast to Ontario and Wisconsin, south to Texas, and east to Georgia.

ENVIRONMENTAL DESCRIPTION

Effigy Mounds National Monument

This type occurs in shallow water of ponds and backwaters. The substrate is muck and the water depth is < 1 meter.

Globally

Stands are found in natural wetlands or artificial impoundments. In Wisconsin, this type is located primarily in the backwaters and impoundments of the Mississippi River and along the deep marshes of the lower Wolf River system (E. Epstein pers. comm. 2003). The hydrology of this association in the Central Appalachian region is highly variable; thus, the hydrologic placement is debatable (Central Appalachian Ecoregional Planning Team pers. comm. 1998).

MOST ABUNDANT SPECIES

Effigy Mounds National Monument

Stratum	Species
FORB	*Nelumbo lutea*

Globally

Stratum	Species

CHARACTERISTIC SPECIES

Effigy Mounds National Monument

Nelumbo lutea

Globally

VEGETATION DESCRIPTION

Effigy Mounds National Monument

Nelumbo lutea creates a canopy on the surface of the water. *Lemna* spp. (*trisulca, minor*) occurs in openings between the *Nelumbo* leaves.

Globally
Stands are essentially monospecific *Nelumbo lutea* communities. This association may be divided as more information becomes available. In the Central Appalachian region, mixed or monospecific *Nelumbo lutea* communities of natural wetlands or artificial impoundments sometimes contain scattered *Cephalanthus occidentalis*. Other floating-leaved aquatic plant species, such as *Nuphar lutea* and *Nymphaea odorata*, may be present, as may emergent species such as *Schoenoplectus tabernaemontani (= Scirpus tabernaemontani), Pontederia cordata, Juncus effusus, Typha latifolia, Eichhornia crassipes* (alien), *Hydrocotyle* spp., and floating aquatics, such as *Salvinia minima, Spirodela* spp., *Lemna* spp., and *Azolla caroliniana* (Central Appalachian Ecoregional Planning Team pers. comm. 1998).

OTHER NOTEWORTHY SPECIES

CONSERVATION RANK G4?. Although natural stands may be relatively rare, this type may also occur in cultural impoundments. The dominant species in stands of this vegetation is widespread across the eastern United States and adjacent Canada. This is not a rare or imperiled vegetation type, even though its occurrence is poorly documented. Stands may occur in natural lakes and ponds or in artificial impoundments.

DATABASE CODE CEGL004323

COMMENTS
Effigy Mounds National Monument

Globally

REFERENCES
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Nuphar lutea ssp. *advena* - *Nymphaea odorata* Herbaceous Vegetation

COMMON NAME	Broadleaf Pondlily - White Waterlily Herbaceous Vegetation
SYNONYM	Water Lily Aquatic Wetland
PHYSIOGNOMIC CLASS	Herbaceous Vegetation (V)
PHYSIOGNOMIC SUBCLASS	Hydromorphic rooted vegetation (V.C)
PHYSIOGNOMIC GROUP	Temperate or subpolar hydromorphic rooted vegetation (V.C.2)
PHYSIOGNOMIC SUBGROUP	Natural/Semi-natural Temperate or subpolar hydromorphic-rooted vegetation (V.C.2.N)
FORMATION	Permanently flooded temperate or subpolar hydromorphic rooted vegetation (V.C.2.N.a)
ALLIANCE	NYMPHAEA ODORATA - NUPHAR SPP. PERMANENTLY FLOODED TEMPERATE HERBACEOUS ALLIANCE

CLASSIFICATION CONFIDENCE LEVEL 3

USFWS WETLAND SYSTEM Permanently flooded temperate or subpolar hydromorphic rooted vegetation

CONCEPT SUMMARY

Globally

This rooted aquatic or open marsh community occupies shallow water depressions, oxbow ponds, backwater sloughs of river floodplains, slow moving streams, ponds, and small lakes throughout the central and eastern United States. It is dominated by rooted, floating-leaved aquatic species, with both submergent and emergent aquatics also present. *Nuphar lutea ssp. advena* and *Nymphaea odorata* are dominants. Other species present may include *Brasenia schreberi*, various *Potamogeton* spp., *Polygonum amphibium*, and *Polygonum amphibium var. emersum (= Polygonum coccineum)*. Submerged aquatics more common in the southern part of the range include *Cabomba caroliniana, Ceratophyllum demersum*, and *Heteranthera dubia*.

RANGE

Effigy Mounds National Monument

Globally

This rooted aquatic community occupies shallow, quiet waters throughout the central and eastern United States, extending from Maine to Ontario and Minnesota, south to Oklahoma and east to Georgia.

ENVIRONMENTAL DESCRIPTION

Effigy Mounds National Monument

Globally

This community occupies shallow water depressions, oxbow ponds, and backwater sloughs of river floodplains, ponds, and small lakes.

MOST ABUNDANT SPECIES

Effigy Mounds National Monument

Stratum	Species

Globally

Stratum	Species

CHARACTERISTIC SPECIES

Effigy Mounds National Monument

Globally

VEGETATION DESCRIPTION

Effigy Mounds National Monument

Globally

This community is dominated by rooted, floating-leaved aquatic species, with both submergent and emergent aquatics also present. *Nuphar lutea ssp. advena* and *Nymphaea odorata* are dominants. Other species present include *Brasenia schreberi*, various *Potamogeton* spp., *Polygonum amphibium*, and *Polygonum amphibium var. emersum (= Polygonum coccineum)* (Anderson 1982). Submerged aquatic species more common in the southern part of the range include *Cabomba caroliniana, Ceratophyllum demersum*, and *Heteranthera dubia*. This broadly conceived type may include ponds, or zones of ponds, dominated by *Nymphaea odorata*, with or without *Nuphar lutea ssp. advena*.

OTHER NOTEWORTHY SPECIES

CONSERVATION RANK G4G5. The dominant species in stands of this vegetation are widespread across the eastern and central United States and adjacent Canada. This is not a rare or imperiled vegetation type, even though its occurrence is poorly documented. Stands may occur in natural lakes and ponds or in artificial impoundments.

DATABASE CODE CEGL002386

COMMENTS
Effigy Mounds National Monument

Globally

REFERENCES

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River Mud Flats Sparse Vegetation

COMMON NAME	River Mud Flats Sparse Vegetation
SYNONYM	River Mud Flats
PHYSIOGNOMIC CLASS	Sparse Vegetation (VII)
PHYSIOGNOMIC SUBCLASS	Unconsolidated material sparse vegetation (VII.C)
PHYSIOGNOMIC GROUP	Sparsely vegetated soil flats (VII.C.4)
PHYSIOGNOMIC SUBGROUP	Natural/Semi-natural Sparsely vegetated soil flats (VII.C.4.N)
FORMATION	Seasonally / temporarily flooded mud flats (VII.C.4.N.c)
ALLIANCE	NON-TIDAL MUD FLAT SEASONALLY/TEMPORARILY FLOODED SPARSELY VEGETATED ALLIANCE

CLASSIFICATION CONFIDENCE LEVEL 3

USFWS WETLAND SYSTEM Seasonally / temporarily flooded mud flats

CONCEPT SUMMARY

Globally

This river mud flat community type is found throughout the upper and central midwestern region of the United States and adjacent Canada, and probably more widely. It extends south at least as far as the Ozarks and Ouachitas of Arkansas. Stands occur in riverine areas that flood in the spring, but dry out later in the season, exposing wet, muddy sediments on which plant species subsequently grow. Substrate includes silt and clay. The composition and structure of the vegetation are influenced by the flooding regime. Vegetation of this type has not been characterized. Stands in south-central Illinois and east-central Missouri contain the characteristic, and rare, *Boltonia decurrens*.

RANGE

Effigy Mounds National Monument

This community type occurs along the Mississippi and Yellow Rivers.

Globally

The river mudflat community type is found throughout the upper and central midwestern region of the United States and adjacent Canada, and probably more widely. Currently, it ranges from Minnesota and Manitoba east to Michigan and Ontario, and south to Illinois and Indiana. It extends south at least as far as the Ozarks and Ouachitas of Arkansas.

ENVIRONMENTAL DESCRIPTION

Effigy Mounds National Monument

Stands occur in areas along the Mississippi and Yellow Rivers that flood in the spring but are exposed later in the season.

Globally

Stands occur in riverine areas that flood in the spring, but dry out later in the season, exposing wet, muddy sediments on which plant species subsequently grow. Substrate includes silt and clay. The composition and structure of the vegetation is influenced by the flooding regime.

MOST ABUNDANT SPECIES

Effigy Mounds National Monument

Stratum	Species

Globally

Stratum	Species

CHARACTERISTIC SPECIES

Effigy Mounds National Monument

Globally

VEGETATION DESCRIPTION

Effigy Mounds National Monument

Vegetation of this type was not characterized during this project. However, based on observations, species likely to be found on mud flats include *Polygonum* spp. *Cyperu*s spp. *Phalaris arundinacea,* and .seedlings of *Acer saccharum, Salix interior*, and *Populus deltoides.*

Globally

Vegetation of this type has not been characterized. Stands in south-central Illinois and east-central Missouri contain the characteristic, and rare, *Boltonia decurrens* (Bill McClain pers. comm. 1996).

OTHER NOTEWORTHY SPECIES

CONSERVATION RANK G?.

DATABASE CODE CEGL002314

COMMENTS

Effigy Mounds National Monument

This community type was added at the end of the mapping project. Thus, data was not collected during plot sampling.

Globally

REFERENCES

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